

## AMENDMENTS

### In the Claims:

1-27. (Canceled)

28. (Currently amended) A method for producing an addressable array of oligonucleotides on a substrate, said method comprising:

contacting an entire surface of said substrate substrate's entire surface comprising a plurality of addressable features each comprising a surface attached blocked nucleoside monomer blocked with a blocking group, or a surface attached polymer blocked with a blocking group, with a deblocking fluid to remove the blocking group, thereby generating an unblocked attached nucleoside monomer or polymer in each of said plurality of addressable features;

displacing in a flow cell the deblocking fluid from said entire surface of said substrate comprising the attached unblocked nucleoside monomer or polymer with by flowing a purging fluid ~~by contacting~~ across said entire surface of said substrate ~~with said purging fluid in a manner that displaces said deblocking fluid from~~ sufficient to produce a stratified fluid interface that moves across said surface; and

reacting the attached unblocked nucleoside monomers or polymers on said surface of said substrate with another blocked nucleoside monomer to produce said addressable array of oligonucleotides, wherein said addressable array comprises oligonucleotides covalently bonded to said surface of said substrate at said plurality of addressable features.

29. (Previously presented) The method of claim 28, wherein a blocked nucleoside monomer is attached to the substrate by contacting the substrate with a fluid comprising a blocked nucleoside monomer at a location on the substrate that comprises hydroxyl functional groups.

30. (Previously presented) The method of claim 28, wherein steps of the method are repeated a plurality of times.

31. (Previously presented) The method of claim 28, wherein the substrate comprises a surface of a planar support.
32. (Previously presented) The method of claim 28, wherein the displacing step causes minimal mixing of deblocking and purging fluids.
33. (Previously presented) The method of claim 56, wherein the substrate comprises a surface of a support containable within a flow cell.
34. (Previously presented) The method of claim 28, wherein the substrate comprises a nascent surface of a planar support.
35. (Previously presented) The method of claim 28, wherein the purging fluid has a density that is different from the deblocking fluid.
36. (Previously presented) The method of claim 28, wherein the purging fluid and the deblocking fluid have a density difference, expressed as the Atwood number (A), of at least 0.01.
37. (Previously presented) The method according to claim 28, wherein the purging fluid has a density that is higher than the density of the deblocking fluid.
38. (Previously presented) The method according to claim 28, wherein the purging fluid has a density that is lower than the density of the deblocking fluid.
39. (Previously presented) The method according to claim 28, wherein the purging fluid is an organic fluid.
40. (Previously presented) The method according to claim 28, wherein the purging fluid comprises an oxidizing agent.
41. (Previously presented) The method according to claim 28, wherein the

purging fluid comprises a wash fluid.

42. (Previously presented) The method according to claim 41, wherein the wash fluid is an organic fluid.

43. (Previously presented) The method according to claim 41, wherein the wash fluid is acetonitrile.

44. (Canceled)

45. (Currently amended) The method according to claim ~~[[44]]~~ 28, wherein the purging fluid is flowed across the surface at a rate ranging from about 1 cm/s to about 20 cm/s.

46. (Previously presented) The method of claim 28, wherein the purging fluid limits the efficiency of deblocking by the deblocking fluid.

47. (Previously presented) The method of claim 29, wherein the hydroxyl functional groups are provided by 5'-OH groups of nucleoside monomers or polymers attached to the substrate.

48. (Canceled)

49. (Previously presented) The method of claim 29, wherein the blocked nucleoside monomer is deposited at the location by pulse jetting.

50. (Previously presented) The method of claim 28, wherein the blocking group comprises an acid labile blocking group and wherein the deblocking fluid comprises an acid.

51. (Previously presented) The method of claim 33, wherein the substrate is contained within a chamber of a flow cell when contacted with deblocking fluid and wherein the chamber comprises at least one fluid inlet and at least one fluid outlet.

52. (Previously presented) The method of claim 51, wherein the flow cell is oriented in an at least partially vertical position.
53. (Currently amended) The method of claim ~~[[44]]~~ **28**, wherein a pressure gradient is used to produce the stratified interface.
54. (Previously presented) The method of claim 28, wherein the deblocking fluid comprises an organic solvent that has a vapor pressure that is less than 13 Kpa at 0 °C and 1 ATM.
55. (Previously presented) The method of claim 28, further comprising contacting the substrate comprising the attached blocked nucleoside monomer or polymer with an oxidation fluid prior to contacting with the deblocking fluid.
56. (Currently amended) A method of producing an addressable array comprising a substrate and at least two oligonucleotides bonded to different locations on a surface of said substrate, said method comprising:
- contacting nucleoside monomers blocked with a blocking group to at least a first location and a second different location of said substrate surface displaying functional groups, under conditions sufficient for the blocked nucleoside monomers to bond to the surface in first and second locations to produce a substrate surface displaying bound blocked monomers;
  - contacting the entirety of said **substrate's entire** surface displaying bound blocked monomers with a deblocking fluid to remove the blocking group, thereby generating unblocked nucleoside monomers at the first and second locations;
  - displacing **in a flow cell** the deblocking fluid from said surface comprising the bound unblocked monomers at the first and second locations with **by flowing** a purging fluid **in a manner sufficient to produce a stratified fluid interface that moves across said surface**;
  - reacting the attached unblocked nucleoside monomers at the first and second locations of said surface with another blocked nucleoside monomer to produce said addressable array having a first oligonucleotide at said first location of said surface

of said substrate and a second oligonucleotide at said second location of said surface of said substrate.

57. (Previously presented) The method of claim 56, wherein the at least two oligonucleotides comprise the same sequence composition.

58. (Previously presented) The method of claim 56, wherein the at least two oligonucleotides comprise different sequence compositions.

59. (Previously presented) The method of claim 56, further comprising contacting the bonded blocked monomers with an oxidation fluid prior to contacting the surface with the deblocking solution.

60. (Canceled)

61. (Previously presented) The method according to claim 28, wherein said substrate is planar.